



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
|-----------------|-------------|----------------------|---------------------|------------------|

10/523,214

01/27/2005

Vito Lambertini

Q85361

8052

23373

7590

07/10/2006

SUGHRUE MION, PLLC

2100 PENNSYLVANIA AVENUE, N.W.

SUITE 800

WASHINGTON, DC 20037

EXAMINER

RAABE, CHRISTOPHER M

ART UNIT

PAPER NUMBER

2879

DATE MAILED: 07/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

AD

| | | | | |
|------------------------------|------------------------|--|---------------------|--|
| Office Action Summary | Application No. | | Applicant(s) | |
| | 10/523,214 | | LAMBERTINI ET AL. | |
| | Examiner | | Art Unit | |
| | Christopher M. Raabe | | 2879 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-29 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

1. Applicant's submission filed March 31, 2006 has been entered and acknowledged by the examiner.
2. Applicant's arguments, see pages 12-16, filed March 31, 2006, with respect to the rejection(s) of claim(s) 24,25 under 35 USC 102(b) and 103(a), respectively have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-6,8,9,14,23,24,26-29 are rejected under 35 U.S.C. 102(b) as being anticipated by Fujishima et al. (USPN 2002/0096107).

With regard to claim 1,

Fujishima et al. disclose a process to make an emitter for light sources, which can be led to incandescence through the passage of electric current, characterized in that a layer made of anodized porous alumina is used as a sacrificial element for the structuring of at least a part of the emitter (paragraphs 37-44).

Art Unit: 2879

With regard to claim 2,

Fujishima et al. disclose the process, characterized in that said structuring consists in obtaining at least one between, a plurality of nanometric reliefs arranged according to a basically predefined geometry on at least a surface of the emitter, and a plurality of nanometric cavities arranged according to a basically predefined geometry within the emitter (paragraphs 37-44).

With regard to claim 3,

Fujishima et al. disclose the process, characterized in that the alumina layer is obtained through consecutive anodizations of an aluminum film deposited onto a surface of a corresponding substrate until a regular alumina structure is obtained, which defines a plurality of pores basically perpendicular to said surface of the substrate the alumina layer having a non-porous portion close to the respective substrate (paragraphs 37-44).

With regard to claim 4,

Fujishima et al. disclose the process, characterized in that the alumina layer is used either as sacrificial template during said structuring or as intermediate template for obtaining a further sacrificial template for said structuring (paragraphs 37-44).

With regard to claim 5,

Fujishima et al. disclose the process including a step of deposition of material through evaporation, sputtering, chemical vapor deposition, screen printing, or electrodeposition (paragraph 27).

Art Unit: 2879

With regard to claim 6,

Fujishima et al. disclose the process, characterized in that structuring includes an etching step (paragraphs 37-44).

With regard to claim 8,

Fujishima et al. disclose the process, characterized in that said structuring includes the following steps: the material designed to make up the desired component having a plurality of reliefs is deposited as a film onto the alumina layer, a part of said material filling said pores, and the alumina layer and its substrate are then removed, thus obtaining the desired component, whose reliefs consist of the part of said material which filled said pores (paragraph 38).

With regard to claim 9,

Fujishima et al. disclose the process wherein the material is deposited onto the alumina layer through sputtering or chemical vapor deposition (paragraph 27).

With regard to claim 14,

Fujishima et al. disclose the process, characterized in that said desired component is said emitter (paragraphs 37-44,12).

With regard to claim 23,

Fujishima et al. disclose an emitter for light sources, in particular a filament, which can be led to incandescence through the passage of electric current obtained with the process according to claim 1, the emitter having at least one between a plurality of nanometric reliefs arranged according to a basically predefined geometry on at least a surface of the emitter; a

Art Unit: 2879

plurality of nanometric cavities arranged according to a basically predefined geometry within the emitter (paragraphs 37-44).

With regard to claim 26,

Fujishima et al. disclose the use of anodized porous alumina as sacrificial element for the structuring of at least a part of an emitter for light sources, which can be led to incandescence through the passage of electric current (paragraphs 37-44).

With regard to claim 27,

Fujishima et al. disclose the use, where alumina is used as template during said structuring (paragraphs 37-44).

With regard to claim 28,

Fujishima et al. disclose the use, where alumina is used as template for obtaining a further template used during said structuring (paragraphs 37-44).

With regard to claim 29,

Fujishima et al. disclose the use, where said structuring allows to obtain at least one between a plurality of nanometric reliefs arranged according to a basically predefined geometry on at least a surface of the emitter; a plurality of nanometric cavities arranged according to a basically predefined geometry within the emitter (paragraphs 37-44).

Claim Rejections - 35 USC § 103

Art Unit: 2879

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 7,10,12,13,21,22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujishima et al. as applied to claims 2,4,5 above, and further in view of Iwasaki et al. (USPN 6278231).

With regard to claim 7,

Fujishima et al. disclose the process.

Fujishima et al. do not disclose a step of anodization of a metal underlying the alumina layer.

Iwasaki et al. do disclose a step of anodization of a metal underlying the alumina layer (column 10, line 35 – column 11, line 10), providing a protective coating on the metal underlying the alumina layer.

Art Unit: 2879

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the step of Iwasaki et al. into the process of Fujishima et al. in order to provide a protective coating on the metal underlying the alumina layer.

With regard to claim 10,

Fujishima et al. disclose the process, characterized in that said structuring includes the following steps: the alumina layer is removed from its substrate and opened at its base, removing its nonporous portion (paragraph 15), the material designed to make up a desired component having a plurality of reliefs is deposited onto the structure formed by the residual part of the alumina layer, a part of said material filling said pores; the residual part of the alumina layer is then removed, thus obtaining the desired component, whose reliefs consist of the part of said material which filled said pores (paragraphs 37-44).

Fujishima et al. do not disclose a conductive metal film deposited onto the alumina layer, nor electrodeposition being used to form the desired component having a plurality of reliefs. However, electrodeposition was well known to those of ordinary skill in the art at the time of the invention to provide an emitter for light sources (desired component), and hence would have been obvious to incorporate into the process of Fujishima et al.

Iwasaki et al. do disclose a conductive metal film deposited onto the alumina layer (column 22, lines 50 – 68), allowing for the formation of components by electrodeposition.

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the step of Iwasaki et al. into the process of Fujishima et al. in order to allow for the formation of components by electrodeposition.

With regard to claim 12,

Art Unit: 2879

Fujishima et al. disclose the process, characterized in that said structuring includes the following steps: localized parts of the non-porous portion of the alumina layer are removed (paragraph 15); the material designed to make up a desired component having a plurality of reliefs is deposited onto the residual part of the alumina layer, and the residual part of the alumina layer is then removed, thus obtaining the desired component, whose reliefs consist of the part of said material which filled said pores (paragraphs 37-44).

Fujishima et al. do not disclose said pores being open on their substrate, nor the material being deposited through electrochemical means.

Iwasaki et al. do disclose pores being open on their substrate and a material being deposited through electrochemical means (column 22, lines 55-68), providing an efficient method of forming the emitter.

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the step of Iwasaki et al. into the process of Fujishima et al. in order to provide an efficient method of forming the emitter.

With regard to claim 13,

Fujishima et al. disclose the process, characterized in that the structuring includes the following steps: the alumina layer is removed through selective etching, a desired component having a plurality of reliefs, said surface projections making up said reliefs (paragraphs 37-44).

Fujishima et al do not disclose the substrate of the alumina layer undergoing anodization.

Iwasaki et al. do disclose the substrate of an alumina layer undergoing anodization (column 10, line 35 – column 11, line 10), and the use of an alumina layer as a mask (column 12, line 50 – column 13, line 30), reducing the number of materials needed.

Art Unit: 2879

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the steps of Iwasaki et al. into the process of Fujishima et al. in order to reduce the number of materials needed.

With regard to claim 21,

Fujishima et al. disclose the process, characterized in that said structuring includes the following steps: at least a part of the non-porous portion of the alumina layer is removed (paragraph 15).

Fujishima et al. do not disclose said pores being thus opened on their substrate; the substrate is selectively dug in the corresponding open areas on the pores; the residual part of the alumina layer is removed the substrate thus making up said emitter, the dug areas of the substrate making up said cavities.

Iwasaki et al. do disclose said pores being opened on their substrate; the substrate is selectively dug in the corresponding open areas on the pores; the residual part of the alumina layer is removed the substrate thus making up said emitter, the dug areas of the substrate making up said cavities (column 4, lines 30-45), providing an emitter structure of the substrate material.

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the step of Iwasaki et al. into the process of Fujishima et al. in order to provide an emitter structure of the substrate material.

With regard to claim 22,

Fujishima et al. disclose the process.

Fujishima et al. do not disclose the digging of the substrate.

Art Unit: 2879

Iwasaki et al. do disclose the substrate being dug on said open areas through reactive ion etching or selective wet etching or electrochemical etching (column 4, lines 30-45), providing an emitter structure of the substrate material.

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the step of Iwasaki et al. into the process of Fujishima et al in order to provide an emitter structure of the substrate material.

7. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fujishima et al. as applied to claim 4 above, and further in view of Tanaka et al. (USPN 5777427).

With regard to claim 11,

Fujishima et al. disclose the process, characterized in that said structuring includes the following steps: the material designed to make up the desired component having a plurality of reliefs is deposited onto the alumina layer, a part of said material filling said pores; and the alumina layer and its substrate are then removed, thus obtaining the desired component, whose reliefs consist of the part of said material which filled said pores (paragraphs 37-44).

Fujishima et al. do not disclose the material being deposited as a serigraphic paste, the paste being sintered.

Tanaka et al. do disclose an analogous material being deposited as a paste, the paste then being sintered (column 6, lines 20-25), providing a material with increased longevity.

Although the method of deposition is not specifically stated, screen printing was well a known and widely used technique at the time of the invention for efficiently forming thin layers, hence would have been obvious to utilize in depositing the paste.

Art Unit: 2879

It would have been obvious to one of ordinary skill in the art at the time of the invention to include the step of Tanaka et al. into the process of Fujishima et al. in order to efficiently provide an emitter with long life.

8. Claims 15-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujishima et al. (as above).

With regard to claim 15,

Fujishima et al. disclose the process.

Fujishima et al. do not disclose said desired component to be said further template.

However, utilizing a first template to form a further template was a well known practice to those of ordinary skill in the art at the time of the invention to produce an object of similar structure to the first template, and hence would have been obvious to incorporate into the process of Fujishima et al.

With regard to claim 16, 17, 18,

Fujishima et al. disclose the process, characterized in that said structuring includes the following steps: a layer of the material designed to make up said emitter is deposited onto said template, and said template is removed thus obtaining said emitter (paragraphs 37-44).

Fujishima et al. do not disclose the further template. However, utilizing a first template to form a further template was a well known practice to those of ordinary skill in the art at the time of the invention to produce an object of similar structure to the first template, and hence would have been obvious to incorporate into the process of Fujishima et al.

Art Unit: 2879

With regard to claim 19,

Fujishima et al. disclose the process, characterized in that the material designed to make up said emitter is deposited onto said template through sputtering or chemical vapor deposition (paragraph 27), and in that said template is removed through selective etching (paragraph 44).

Fujishima et al. do not disclose the further template. However, utilizing a first template to form a further template was a well known practice to those of ordinary skill in the art at the time of the invention to produce an object of similar structure to the first template, and hence would have been obvious to incorporate into the process of Fujishima et al.

9. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fujishima et al. as applied to claim 16 above, and further in view of Tanaka et al. (as above).

With regard to claim 20,

Fujishima et al. disclose the process, characterized in that the material designed to make up said emitter is deposited onto said further template the latter being then removed through selective etching (paragraphs 37-44).

Fujishima et al. do not disclose the material as a serigraphic paste, nor the further template. However, utilizing a first template to form a further template was a well known practice to those of ordinary skill in the art at the time of the invention to produce an object of similar structure to the first template, and hence would have been obvious to incorporate into the process of Fujishima et al.

Tanaka et al. do disclose an analogous material being deposited as a paste, the paste then being sintered (column 6, lines 20-25), providing a material with increased longevity.

Art Unit: 2879

Although the method of deposition is not specifically stated, screen printing was well a known and widely used technique at the time of the invention for reliably creating thin layers, hence would have been obvious to utilize in depositing the paste.

It would have been obvious to one of ordinary skill in the art at the time of the invention to include the step of Tanaka et al. into the process of Fujishima et al. in order to provide an emitter with long life.

10. Claims 24,25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujishima et al. as applied to claim 23 above, and further in view of Gee et al. (WO 03/019680).

With regard to claim 24,

Fujishima et al. disclose the emitter.

Fujishima et al. do not disclose the reliefs making up an antireflection microstructure.

Gee et al. do disclose an emitter having reliefs that make up an antireflection microstructure (page 4, lines 5-15), providing a more efficient emitter.

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the configuration of Gee et al. into the emitter of Fujishima et al. in order to provide a more efficient emitter.

With regard to claim 25,

Fujishima et al. disclose the emitter.

Fujishima et al. do not disclose said cavities being part of a photon crystal structure.

Gee et al. do disclose an emitter with cavities having a photonic crystal structure (page 4 lines 5-15), providing a more efficient emitter.

Art Unit: 2879

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the configuration of Gee et al. into the emitter of Fujishima et al. in order to provide a more efficient emitter.

Response to Arguments

While the applicant argues that the emitter of Fujishima et al. is not used as an incandescent source, the examiner asserts that it is only necessary that the emitter of Fujishima be capable of emission by incandescence, a criterion the examiner maintains the emitter of Fujishima et al. meets. Additionally, the applicant argues that Fujishima et al. fail to disclose a material being deposited onto the alumina as a film. The examiner maintains that this is disclosed by Fujishima et al. in paragraph 38, which states "the anodized porous alumina is placed in a vessel for the formation of diamond film."

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher M. Raabe whose telephone number is 571-272-8434. The examiner can normally be reached on m-f 7am-3:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel can be reached on 571-272-2457. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2879

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

CR


ASHOK PATEL
PRIMARY EXAMINER